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MAN AND BEAST.

TO THE EDITOR OF THE ANTHROPOLOGICAL REVIEW.

Sir,—The late work of Professor Huxley has attracted much attention amongst anthropologists; and as its learned author would say, it is the duty of the man of science “to reexamine the common stock in trade, so that he may make sure how far the store of bullion in the cellar, on the faith of whose existence so much paper has been circulating, is really the solid gold of truth.”

The vehement manner in which Professor Huxley has supported the theory of the derivation of Man from the inferior animals, has surprised many of those biologists who were aware of the equally vehement manner in which he had previously denied both progression and transmutation. There was a time, ten short years ago, when the same eloquence which is now employed in lowering “Man’s place in Nature,” uttered its vehement strains in the scientific theatre of Albemarle Street* in disparagement of the transmutative doctrine. There was a time, when the alleged instances of transmutation afforded by the class of fishes were tested by the anatomical and embryological conclusions disclosed by Vogt. “Those theorists” who contended that there had been a progressive development of life since the globe first became habitable, commencing with the simplest forms of organization, and proceeding regularly upwards to the most complex, were severely criticized, and it was stated that such a view of creation was not compatible with the facts disclosed by geological researches. Professor Huxley at that time confidently assured his audience that a close examination dispelled the notion of progressive development, and proved that it had no solid foundation.

While recognizing to Professor Huxley, as to every other scientific man, a free and perfect right to change his opinions, we would have thought that some charitable feeling might have been due on his part to those zoologists who may be working out a theory of transmutation, and who may object to accept in its entirety the Darwinian system. Professor Huxley, however, tells us that this hypothesis of animal causation is the only one which has any scientific existence. We, on the other hand, prefer to suspend our judgment on the matter,

* *Journal of the Royal Institution*, 1855.

regarding no transmutative theory as yet proven. That a future generation may witness the development of a more perfect theory than that of Mr. Darwin is extremely probable; and we think it most unfair that Mr. Huxley should put us in the alternative, "either Darwinian or nothing."* The advocates of the Ptolemaic theory of the planetary motions, triumphantly unopposed, might have put the case "Ptolemy or nothing" prior to the age of Copernicus; and this use of the *argumentum ad ignorantiam* on their part would have inspired subsequent generations with a lower idea of their prescience than the old astronomers merit.

Professor Huxley states that—"The question of questions for mankind—the problem which underlies all others, and is more deeply interesting than any other—is the ascertainment of the place which man occupies in nature, and his relations to the universe of things."

Face to face with the present position of metaphysical thought in England, that anthropology which can find no higher employment for the human mind than the ascertainment of man's relations with the baboons will find no place at all. Even if the transmutation of species were demonstrated, and if the intervening links connecting the human species with the baboons were discovered, the psychical attributes which distinguish man from the inferior types baffle the analysis of the reasoner. Even on the assumption that the intellect of man is so directly coordinated with his material structure as to be dependent on the amount, complication, and quality of the brain, the vast cerebral gulf between man and the ape draws a wide line of demarcation between the psychical nature of the two forms. And when we glance at the vast and high frontal lobe of the human brain, the expanded median lobe, and the bulky and projecting occipital lobe, whose mass extends backwards far beyond the cerebellum, we see a substratum on which the psychical manifestations of man undergo their complicated changes and alternations. We cannot discover in the highest ape any such material organ.

With respect to these higher psychical manifestations which are not directly correlated with the nervous system, and the proof of whose existence does not rest upon the demonstration of *Man's Place in Nature*, we shall not allude to them here. Professor Huxley would not appreciate our argument, and we are content to say, *Dignius credere quam scire*.

To meet Professor Huxley on the more common ground of meta-

* *On our Knowledge of the Causes of the Phenomena of Organic Nature*. 8vo. London, 1862, p. 150.

physical thought, we are surprised at the manner in which he disregards all the attributes of perceptive reason developed in man, and asserts that the highest knowledge is the knowledge of our relations to the outward world. A more subtle analysis of the hidden fountains of the human mind was revealed to us from the schools of Alexandria,* and has been revived in the latter Germanic philosophy. A more noble occupation of the mind of the truly positive philosopher is that which, attempting to unravel the physiological and psychological significance of man himself, absolutely, as he stands, without reference to any other being, obeys implicitly the direction of Thales, *γνώθι σεαυτόν*. A more truthful task for the philosophic inquirer, would be like the fervent and nature-seeking philosopher of Berlin, who

“ Did cast into the depths of his own soul again
The fearless glance, and there, with humble heart,
Did prove the secret of all mythic thought,”

to discover those distinctions between the relations of brain and thought, on which alone a consistent science of psychology will be based.

It may appear strange that a writer who adopts the metaphors of the theological school of teleologists, should found the essential doctrines of his own philosophy on the teachings of the most advanced school of Materialists in Germany. When we glance over the pages of *Man's Place in Nature*, we are irresistibly led to the conviction that the voice is the voice of Büchner, though the words are those of Huxley. The learned author of *Kraft und Stoff* will, however, scarcely recognize his disciple in the tortuous involutions of metaphysical analysis through which he drags his weary auditor, with a view, firstly, to prove the analogy between the cerebral structure and a devised machine, and, secondly, to base our ideas of psychological variation on functional changes in the brain's structure.

Professor Huxley, in reply to the argument brought against him by the Rev. Mr. Molesworth and Mr. Luke Burke, who contended that “the superior psychical manifestations of the human species must be associated with concurrent modifications of his bodily frame and organs,” says, “The argument that because there is an immense difference between a Man's intelligence and an Ape's, therefore, there must be an equally immense difference between their brains, appears to me to be about as well based as the reasoning by which one should endeavour to prove that because there is a ‘great gulf between a watch

* Plotius, *Enneades*, v, lib. 5.

that keeps accurate time, and another that will not go at all, there is, therefore, a great structural *hiatus* between the two watches. A hair in the balance-wheel, a little rust on a pinion, a bend in a tooth of the escapement, a something so slight that only the practised eye of the watchmaker can discover it, may be the source of all the difference.' "

The utter inapplicability of the comparison between a "moving thing that has life" and an engine-turned machine made by man, seems transparently obvious. Moreover, the watch simile is completely threadbare; it has been used *usque ad nauseam* by Nieuwentyt and Paley, and refuted by more accurate metaphysicians. Professor Huxley's expression, "*all* the difference," we do not consider to be justified by his argument. The "rust on the pinion" is, indeed, a structural *hiatus*, but we could conceive that the difference may arise from other causes. Expansion of the metal of the pendulum by heat would be a structural change that would also account for the stoppage, and we have no doubt that some analogous "difference in the combination of the primary molecular forces of living substance" might account for *some* of the variation between Man and the Apes, without confidently assigning to it the *vera causa* of the totality of differentiation.

Professor Huxley is forced (we presume by "atavism") to revert to the original definitions as propounded by Gratiolet; and the writer, who boasts of "having done his best to sweep away the vanity" of forming a classification based on physical characters, as understood by the old anatomists, and who alleges "that the attempt to draw a psychical distinction is equally futile," actually proposes the following tests of differentiation: "Let it be admitted, however, that the brain of man is absolutely distinguished from that of the highest known apes, 1st, by its large size, as compared with the cerebral nerves; 2nd, by the existence of the lobule of the marginal convolution; 3rd, by the absence of the external perpendicular fissure."

Certainly the above cannot be deemed "structural differences which shall be absolutely inappreciable to us with our present means of investigation," still less are they differences which we can deem to be modifiable under the operation of a law of natural selection. Of course, if we abrogate our position as students of truth, inductively ascertained, we can realise how long successive ages may have operated to influence the convolutions of the brain.

But the realization of such a chimerical dream belongs to that future period, which some hope is fast approaching, when the truths of science, which have been obtained through laborious efforts during

the past two hundred years, will be forgotten, and "natural selection," or some equally inconclusive figment of the imagination will be elevated as the dogma unto which all scientific men must yield belief.

The brightest periods of science and philosophy in past ages have often been succeeded by retrogressive epochs, similar in nature to the "new Saturnian age of lead," is now in the ascendant. To Germany and France, where the developmental sympathies of zoologists have not yet led them to propound a system so thoroughly at variance with ascertained truths as that of natural selection, we may look at some future time for the diffusion of a system demonstrating transmutation on grounds based on observed facts, and compatible with our present state of knowledge.

Professor Huxley's work is, however, styled *Evidence as to Man's Place in Nature*. The nature of this evidence it is the duty of the sincere anthropologist to sift, and we will endeavour fearlessly to perform this task as regards some of the facts which Professor Huxley brings forward.

Dissatisfied with the state of our knowledge respecting the measurement of the human skull, Professor Huxley proposes an entirely new system of classification. He says, "I have arrived at the conviction that no comparison of crania is worth very much that is not founded upon the establishment of a relatively fixed base line, to which the measurement in all cases must be referred. Nor do I think it is a very difficult matter to decide what that base line should be." He, therefore, selects a line as the normal base of the skull, or basicranial axis, which line passes through the centres of the bones termed basioccipital, basisphenoid, and presphenoid. He states that this basicranial axis is a relatively fixed line, or to which the arcs described by the various cranial axes form various planes, at angles all comparable with the given modulus afforded by the basicranial line. Professor Huxley has, therefore, completely pledged himself to the new system of craniometry proposed by him in his third essay "On the Fossil Remains of Man."

Six skulls are drawn on Professor Huxley's 79th page, respectively those of the Australian, squirrel monkey, gorilla, baboon, howler, and lemur. Glancing at these figures, the first impression which an inquirer, unacquainted with the anatomical details of the case, would be led unwarily to make, would be, that the figures were all drawn on one uniform plane, so as to show fairly the degree

of overlap of the cerebrum over the cerebellum in those apes in which an overlap is visible. Professor Huxley, however, does not adopt any such plan; the base line of each skull, parallel with the bottom of his page, is not the "basicranial" line suggested by him; it is not the "tentorial" line; it is not a line transverse to the axis of the occipital foramen; it is not transverse to the Abbé Frère's line from the *meatus* to the coronal suture; it is not the "glabella-occipital" line; nor is it the *longitudo racheos* of Von Baër. What then is it? It is a line drawn to give the cerebral cavity the same length in each figure respectively; a line which has the effect of placing the *mycetes* and *lemur* skulls at the foot of his plate at a distorted angle wholly at variance with that in which the other skulls are placed. The effect of this shifting process has been to double, at least, the postcerebellar overlap in the *chrysothrix*; to enlarge it from —0 to $+\frac{3}{10}$ to $\frac{4}{10}$ inch in the gorilla and howler monkey, and almost to treble its dimensions in the baboon. We have rarely seen so peculiar an application of the pictorial *art de pose* in the production of figures intended for a general audience, and destined to illustrate nice points of scientific controversy. We are entirely at a loss to know what is the cause of this discrepancy. We catch, however, a glimmering light from the advertisement at the beginning. We are told that "the greater part of the substance of the following essay has already been published in the form of oral discourses, addressed to widely different audiences during the past three years." Peradventure one of the modes of cranial admeasurement which Mr. Huxley so seriously propounds belongs to the "pre-Darwinian" age of the controversy; peradventure it even dates its early embryonic existence to the period when Professor Huxley pleaded so strongly against the doctrines of transmutation. However this may be, and whatever change may have taken place in Professor Huxley's opinions, the system of measurement which he advocates in his second is wholly irreconcilable with that taken up in his third essay. His two propositions are mutually destructive. As he takes due care to impress on our minds that "it is the first duty of an hypothesis to be intelligible," this unaccountable laxity seems strangely out of place when applying an exact system of craniometry to the elucidation of "Man's Place in Nature."

Whatever criticisms we may pass upon the anatomical value of the facts put forward by Professor Huxley, we are free to admit that they are worthy far more serious consideration than those promulgated by

his followers. Sir Charles Lyell refers to alleged testimony* on this point. We are in a position to estimate the scientific value of the generalization alluded to. It is sought—by the demonstration of the alleged fact that the verticality of the occiput in “Turanian” crania depends, not upon curtailment of cerebellum, but upon the curtailment of the posterior apical lobules of the cerebral hemispheres—to show that the great overlapping cerebral lobe is not a constant character in man. Rarely has an error so grave of fact, observation, and deduction been committed even by the most ill-informed phrenologists. It is true, that in many short-headed or brachycephalic skulls the cerebral lobes do not project far over, or may even, according to Retzius, fall short of the cerebellum. The demonstration of this fact rests on an examination of the bisected skull. The greatest authority on cerebral anatomy in Europe† has, however, warned us against too confident generalizations. He has pointed out that often a truncated occiput is correlated with an immense, a projecting occiput with an atrophied cerebral lobe. The allegation that we can predict by mere inspection of the outward aspect of the occiput of any skull the degree to which the cerebral lobes project over the cerebellum we regard as one which cannot be considered seriously on any scientific grounds whatever.

That which has tended very much to keep alive the controversy is, that some advocates of transmutation have shrunk from testing the truth of their theories before the world, and have neglected those public opportunities which have occasionally arisen for the elucidation of the question. The audience collected last year at the British Association (Section D) were told that they were “a somewhat promiscuous assemblage,” of “limited information,” and “scarcely competent to judge of matters of anatomical fact.” We have no sympathy for the deviser of this equivocal excuse for not telling a plain story, especially as we remember that some of England’s best zoologists and anatomists, the *élite* of British science, were present on the occasion. Messrs. Schröder van der Kolk and Vrolik say—“*Il paraît que l’année 1861 a été funeste en Angleterre aux Chimpanzés et aux Orangs.*” The year 1862 has been still more disastrous to the memory of the founder of systematic zoology. The remark has been made by a controversialist—“Why Linnæus named the *Cebus capu-*

* “See also, on this subject, Professor Rolleston on the Slight degree of Backward Extension of the Cerebrum in some races of Men.—*Medical Times*, October, 1862, p. 419.” Sir Charles Lyell, *Antiquity of Man*; 8vo, London, 1863, p. 488.

† Gratiolet, *Bull. Soc. Anthropol.*, vol. ii, p. 257.

cinus Cebus fatuellus I know not." Zoologists of "limited information" certainly thought that Linnæus named it *Simia fatuellus*,* and that the name *Cebus fatuellus* was given by Erxleben, in the year 1777, when the Swedish naturalist had long ceased to write, and only a year before his decease. It cannot be expected that even "a promiscuous audience" would be so credulous on a matter of elementary zoological fact as to believe that Linnæus gave generic value to the distinction between the Catarhine and Platyrrhine monkeys. We must not, however, expect too much from an author who, before the Royal Institution, spoke of the Vervet monkey as *Cercopithecus Lalandi*, ignoring altogether the labours of the deceased zoologist and true labourer, Isidore Geoffroy St. Hilaire.† The illustrious Frenchman whose labours are thus slurred over has carefully pointed out the marks of distinction between the *Cercopithecus Lalandi*, Is. Geoff. (*C. pusillus*, Desmoulins), and the true Vervet, *Cercopithecus pygerythrus*, Desmarest; and when we see these two wholly distinct species confused together, we cannot but wonder in amazement what can possibly be the species of monkey to which such exceedingly vague reference is made.

The same writer, speaking of Schröder van der Kolk and Vrolik's *Note sur l'Encephale de l'orang*, confidently states, "so far as the ventricles go, (*sic in orig.*) the figures given in the current number of the *Natural History Review* might very easily be interchanged with that standing for human structures in the drawing of anatomists, who had never dreamt of contrasting these organs with those of the ape. And should any one retaining any lurking kindness for the posterior cornu, come thus warped, to decide which of the two figures was intended for the simious, and which for the human brain, infallibly his judgment would be wrong." We would ask any competent human anatomist to compare the anterior cornua of the orang and chimpanzee with those of man, and contrast the stunted, rounded, comparatively straight anterior horn of the ape's with its tapering, slender, divaricated homologue in man. No serious student, anxious only to arrive at a fair conclusion on the facts, and not by meretricious eloquence to enlist the sympathies of a "promiscuous audience," will venture to assert that they can "easily be interchanged." The criticism applied to Apollonides, "*Tu certe neque tu vides intelligis, neque tu audes memoria tenes*," is most applicable in the present case.

The mode in which the presence of a simial structure, admittedly

* *Systema Naturæ*, ed. xii, vol. i, p. 43. *Systema Regni Animalis*, 8vo, p. 51.

† D'Orbigny, *Dict. Univ. d'Histoire Naturelle*.

homologous with the *hippocampus minor* in man is paraded, with a view to obscure our perception of its developmental inferiority, is a characteristic example of the reasoning of the new transmutative school. No zoologist, however, of any repute, has denied the existence of these rudimentary structures.

It would be utterly inconclusive, and at an absurd variance with logical necessity, to assert, because a first-rate man-of-war, carrying a hundred and twenty or a hundred and thirty guns, exhibited one of the highest forms of naval power, that consequently smaller craft must be entirely destitute of any armament whatever. The forced application of the dictum of the schools *de omni et nullo*, is wholly inapplicable to the spirit of zoological classification, which is founded rather on our ideas of subordination to known type than any class characters.

The skeleton of the orang would have afforded in the "*indice*" of the great toe, the same ground for impugning that zoological character of man which the brain of orang, in its "*indice du petit pied d'Hippocampe*" afforded in the denial of the "*hippocampus minor*" as a zoological character. A disingenuous advocate would have found the one just as serviceable for his purpose as the other. Viewed as discoveries, they are alike; but both closely resemble that of a certain nidamental structure, which gives, usually, but a short-lived pleasure to its finder.

In the above observations which it has been our duty to make on Professor Huxley's work, we have endeavoured while criticising his method of inquiry to recognize the fact that a derivative origin of the whole of the animate creation may be hereafter proved by accurate scientific induction. The day is long gone by when the probability of transmutation could be sneered down as the phantasm of a dreamer, or the product of the scepticism of an infidel. The possibility, nay, even the extreme likelihood of such a law being eventually established is now rapidly becoming a tolerated doctrine in the creed of deep thinking scientific men. Should such a theory be proved, it must be borne in mind that until it is so inductively demonstrated by observation, experiment, or well grounded inference, we are not entitled to assume its existence. If there is such a derivative law, and we have now the sanction of some of our highest zoologists to believe in its existence, when the time comes we shall not shrink from applying it to the discovery of the genesis of the human species. We have no real fear that the consequences which may result from the practical application of this law will be prejudicial to religion, morality, or society. It is the duty of scientific teachers to endeavour

to discover this law; it is the duty of those who are sincere votaries of the truths of science to accept the law when it shall have been inductively proved. But, until the day comes when such a law shall be fully, entirely, and satisfactorily established, we must strenuously protest against the diffusion, even amongst "the wider circle of the intelligent public," of essays, the object of which is to render "Man's place in Nature" closer to that of the brute creation. Professor Huxley's work is especially obnoxious to criticism, as it does not import a single new fact into the treasury of scientific knowledge; it contains no exalted views as regards man's true position, and the volume generally is destitute of that spirit which aims at the diffusion of accurate truths, ascertained by careful and patient investigation, and presented to the world in a temperate and ingenuous spirit.

We are now at the very threshold of the great controversy respecting man's true zoological position. To all those who may feel disposed to investigate the subject, and who may be inclined either to check free inquiry, or to rush hastily to a dogmatic conclusion, we would say, in the words of the philosopher of Königsberg, whose mental teachings have revolutionized the thoughts of mankind.

"Let each thinker pursue his own path; if he shews talent, if he gives evidence of profound thought, in one word, if he shows that he possesses the power of reasoning, reason is always the gainer. If you have recourse to other means, if you attempt to coerce reason, if you raise the cry of 'treason to humanity,' if you excite the feelings of the crowd, which can neither understand nor sympathize with such subtle speculations, you will only make yourselves ridiculous. For the question does not concern the advantage or disadvantage which we are expected to reap from such inquiries; the question is merely, how far reason can advance in the field of speculation apart from all kind of interest, and whether we may depend upon the exertions of speculative reason, or must renounce all reliance upon it. Instead of joining the combatants, it is your part to be a tranquil spectator of the struggle—a laborious struggle for the parties engaged, but attended in its progress, as well as in its result, with the most advantageous consequences for the interests of thought and knowledge."*

Ανθρῳπος.

* *Kritik der Vernunft.*